

## TWO NEW SPECIES OF *MYROCONGER* (ANGUILLIFORMES, MYROCONGRIDAE) FROM THE PACIFIC OCEAN

by

P.H.J. CASTLE (1) and Philippe BEAREZ (2)

**ABSTRACT.** - *Myroconger prolixus* n.sp., described from a 383 mm TL specimen trawled in 260-280 m southeast of New Caledonia, and *Myroconger nigrodentatus* n.sp., described from a 366 mm TL specimen taken from a fish market at Manabí, Ecuador, are the third and fourth species known for the genus and family. *M. prolixus* differs from the East Atlantic *M. compressus* Günther and the western North Pacific *M. gracilis* Castle in being much more slender and more elongate, in having a longer snout and more lateral line pores, and more preanal, precaudal and total vertebrae. *M. nigrodentatus* is somewhat like *M. compressus* in its robust body, short snout and relatively few lateral line pores but differs from all species in having the lowest number of preanal, precaudal and total vertebrae and most notably, internally dark-pigmented teeth, a large slit-like branchial aperture and bright orange body coloration.

**RÉSUMÉ.** - *Myroconger prolixus* n.sp., décrit à partir d'un spécimen de 383 mm LT, chaluté à 260-280 m de fond au sud-est de la Nouvelle Calédonie et *Myroconger nigrodentatus* n. sp., décrit à partir d'un spécimen de 366 mm LT trouvé sur un marché au poisson de Manabí, Equateur, sont les troisième et quatrième espèces connues à ce jour pour ce seul genre de la famille des Myrocongridae. *M. prolixus* diffère de *M. compressus* Günther de l'Atlantique Est et de *M. gracilis* Castle du Pacifique Nord-Ouest en étant plus mince et plus allongé, en ayant un museau plus long, des pores de la ligne latérale plus nombreux et des nombres de vertèbres préanales, précaudales et totaux plus élevés. *M. nigrodentatus* ressemble à *M. compressus* par son corps robuste, son museau court et son nombre relativement peu élevé de pores de la ligne latérale, mais diffère de toutes les espèces par son faible nombre de vertèbres préanales, précaudales et totales, et plus notablement par ses dents intérieurement foncées, par sa grande ouverture branchiale en fente et par sa robe orange brillant.

**Key-words.** - Myrocongridae, *Myroconger prolixus*, *Myroconger nigrodentatus*, ISEW, New Caledonia, Ecuador, New species.

Some 15 families of eels are currently recognised (Robins, 1989). Of these only the Myrocongridae and Colocongridae have single genera, each with few species. *Myroconger* Günther, 1870 is known from just two specimens of *M. compressus* Günther, 1870 taken at St. Helena (supposedly; the holotype) and Senegal, West Africa, and *M. gracilis* Castle, 1991 from the holotype from the Kyushu-Palau Ridge, western North Pacific. Smith (1984, 1989) has discussed the affinities of the Myrocongridae, noting its relationship to the Muraenidae and Chlopsidae as their primitive sister group.

The discovery of *M. gracilis* in the Indo-Pacific (Castle, 1991) showed that the family is not restricted to the East Atlantic, as had long been assumed. The recent capture,

(1) School of Biological Sciences, Victoria University of Wellington, P.O. Box 600, Wellington 6000, NEW ZEALAND.

(2) Muséum national d'Histoire naturelle, Laboratoire d'Ichtyologie générale et appliquée, 43 rue Cuvier, 75231 Paris Cedex 05, FRANCE.

during exploratory trawling in deepish water on seamounts southeast of New Caledonia and also by fishers working off the Ecuador coast, of two myrocongrid specimens clearly differing from either *M. gracilis* or *M. compressus*, represents a further remarkable addition to this distinctive family of eels. Regrettably, there are insufficient specimens of the Pacific material of either *M. gracilis* or the two new species to explore the relationships of the family more than has been done by Smith (1984) for *M. compressus*. However, it seems likely that *M. gracilis* and the New Caledonia species represent the more primitive sister-group of the Atlantic *M. compressus* and the Ecuador species.

The two newly discovered specimens are clearly myrocongrids. They have multiseptal, sharp dentition on the jaws, the posterior nostril high on the snout and level with dorsal margin of orbit, an anterior dorsal origin, a much reduced lateral line, and most significantly a pectoral fin is present. Comparison of them with the two known species (*M. compressus* and *M. gracilis*) revealed that they were different to either. From the type species (*M. compressus*) the New Caledonia specimen differs externally in being much more slender and elongate in body form, in having a longer snout, in having 11 lateral line pores rather than 5-7, and in the more prominent jaw dentition, as seen in *M. gracilis*. Internally it differs from both *M. compressus* and *M. gracilis* in having higher numbers of vertebrae and fin-rays. Though these differences do not warrant distinction of the present specimen at the generic level, they indicate that the New Caledonia specimen differs from both *M. gracilis* and *M. compressus* and therefore belongs to an undescribed species. In contrast, but also representing something new, the Ecuador specimen is rather like *M. compressus* in being robust-bodied and in having a relatively short snout and 6 lateral line pores. However, the jaw dentition is prominent as in the other Pacific species and the specimen has the lowest number of vertebrae and fin-rays of all four species; it also has a slit-like, almost horizontal branchial aperture and intermaxillary and jaw teeth dark-pigmented internally.

Institutional abbreviations are those provided by Leviton *et al.* (1985). Measurements were made with dial calipers and follow those defined in an earlier account (Castle, 1991). Proportional measurements are given in terms of the total length since the contribution of the caudal fin to the total is so small. The proportions of structures on the head are so relatively small compared with the total that they are given in terms of the head length.

### **MYROCONGER PROLIXUS N.SP.**

(Figs 1, 2, 6 to 8)

Myrocongridae ind. - Lehodey *et al.*, 1992: 62, 75, 90.

#### **Material examined**

*Holotype*. - MNHN 1994-844 (initially catalogued NMNZ P.29324) (TL 383 mm), "Alis" cruise BERYX XI, station CP24, Kaiyo Maru Seamount (24°23.40'S, 168°07.65'E to 24°44.15'S, 168°07.40'E), 260-280 m, beam trawl, 17 Oct. 1992 (14h33-14h52).

#### **Diagnosis**

A species of *Myroconger* with body very slender; snout relatively long; neurocranium very slender; teeth prominent and sharp, especially those on intermaxillary and inner



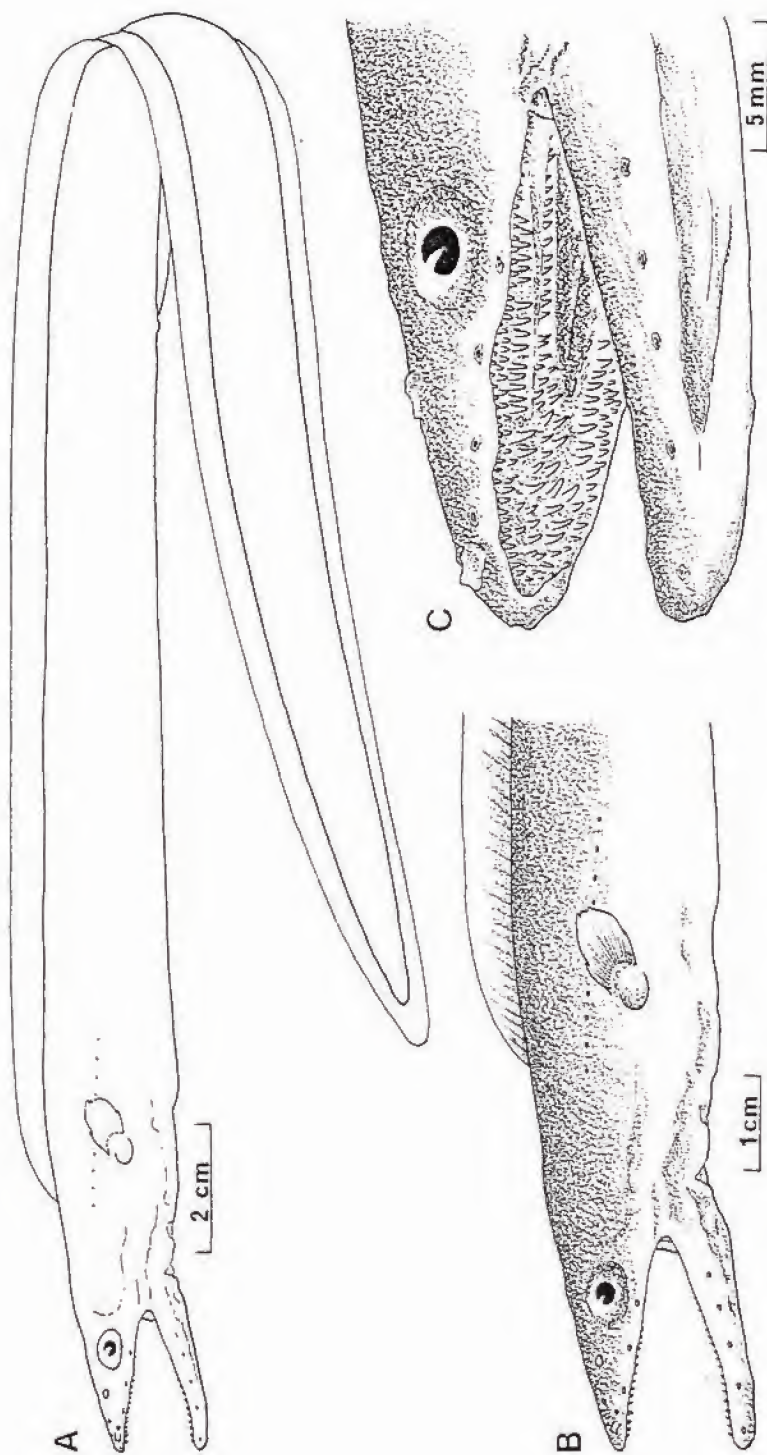


Fig. 1. - *Myroconger prolixus*, holotype MNHN 1994-844, SL 377 mm. A: body, lateral view; B: head; C: anterior part of head, ventrolateral, to show intermaxillary, maxillary and vomerine teeth.

row of maxilla and dentary; preanal vertebrae 57, precaudal vertebrae 71, total vertebrae 147.

### Description

Body markedly elongate, moderately compressed along its length (Fig. 1A). Snout sharp, depressed. Lower jaw slender, its tip level with snout tip. Anterior nostril a simple short tube; posterior nostril a simple aperture with a slightly raised rim, placed about level with upper margin of eye and just behind midpoint between anterior nostril and front margin of eye. Mouth cleft relatively long, extending behind eye for a distance about equal to two-thirds eye diameter. No lips. Eye relatively large, oval. Interorbital broad. Branchial aperture lunate, oblique, its upper extremity well in advance of lower. Pectoral fin relatively short, somewhat longer than eye diameter, broadly oval, its base oblique and matching branchial aperture, the fin directed somewhat dorsad. Dorsal fin origin noticeably before levels of branchial aperture and pectoral base. Anus placed a little before mid-length so that tail is somewhat longer than head and trunk (preanal) combined. Dorsal fin height about one-quarter of body depth, anal fin lower. Caudal fin rounded. Lateral line pores inconspicuous, 11 present, the first about level with dorsal origin, four pores before pectoral fin base, the eleventh pore 18 mm behind upper point of pectoral base. Head pores rather few (Fig. 1B). Supraorbital pores 3, with one ethmoid and two others above and behind base of anterior nostril; infraorbital pores four, the last below middle of eye; no postorbital pores; preoperculo-mandibular pores five, all in front of rictus; no other pores.

Teeth on jaws, intermaxillary and vomer (Figs 1C, 2) conspicuous, very sharp, slightly recurved, generally multiserial. Three rows of teeth on maxilla and dentary, about 55 in outermost row and smallest, about 25 in innermost row and largest. About 20 intermaxillary teeth, generally largest in mouth and movable, in a patch confluent with that of vomer, the more posterior teeth directed backwards. About 25 vomerine teeth in a long, narrow, more or less uniserial band but with two to three rows anteriorly, the band reaching to well beyond level of rear margin of eye.

Colour when freshly caught generally light tan tinged with violet on head and above

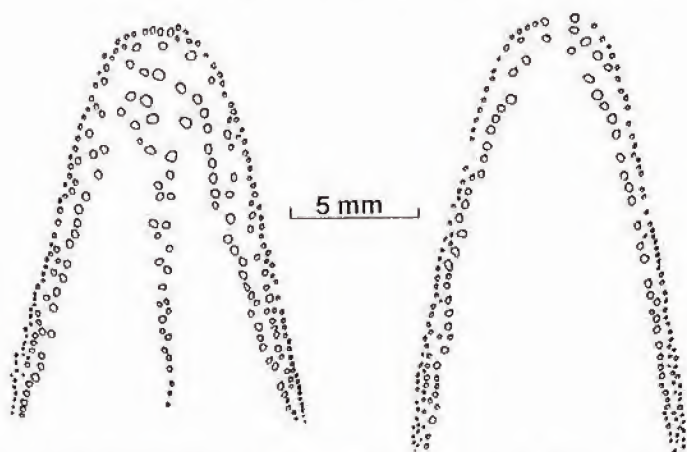


Fig. 2. - *Myroconger prolixus*, holotype, MNHN 1994-844, SL 377 mm. Upper (left) and lower (right) dentition.



lateral line; tip of snout light yellow; a broad, yellowish band below lateral line; off-white below from throat to anus; posterior part of anal fin and caudal distinctively light lime green-yellow; iris brilliant white. When thawed and in alcohol the specimen became generally light tan above.

Holotype a mature female packed with ova, each about 0.7 mm diameter. An incision in right ventrolateral body wall to determine sex and reproductive state of specimen.

### Distribution and biology

The single specimen of *M. proluxus* was collected by beam trawl on the western edge of Seamount A, one of a group of three such seamounts located at the northern end of the Norfolk Ridge, some 130 km southeast of Nouméa, New Caledonia. As described in detail by Lehodey *et al.* (1992) the three seamounts more or less occupy the area encompassed by 24°30'S, 168°00'E to 25°03'S, 168°48'E. More specifically, the top of Seamount A is at about 300 m depth and is roughly tear-shaped with the narrow end facing south. The top at its widest part occupies the area approximately between 24°42'S to 24°48'S, 168°07.50'E to 168°09.80'E. No details are available as to the nature of the bottom on this seamount, except that it is likely to be rough in whole or in part.

Comparison can usefully be made between the above situation and the location of capture of the holotype of the northwest Pacific species *M. gracilis*. The single known specimen of this species was collected at the north end of the Kyushu-Palau Ridge approx. 26°46'N, 135°20'E, some distance south of Japan, in 640-320 m. The bottom was rough rock and sand, the gear being a bottom trawl modified to operate on rough bottom (K. Amaoka, pers. comm.).

The collection location of the holotype of the Atlantic species *M. compressus*, generally given as St. Helena, is apparently in some doubt (Smith, 1984). The latter author suggests that "the west coast of Africa seems to be the most likely place to look for the species" and that "it lives cryptically in areas that are largely untrawlable".

The collective distributional information for the three species from Atlantic, northwest and southwest Pacific points fairly conclusively to an isolated, hard-bottom habitat for these rare myrocongrid eels, and because of the difficulties associated with sampling such a habitat, at least for fishes, further specimens are likely to be only infrequently taken.

### Etymology

The specific name is meant to denote "long bodied" and is derived from the Latin *prolixus* literally meaning long, extended, drawn out, in reference to the elongate body of the species, even more so than that of *M. gracilis*.

## MYROCONGER NIGRODENTATUS N.SP.

(Figs 3 to 5, 6, 9)

### Material examined

*Holotype*. - MNHN 1994-845 (TL 366mm), fish market at Puerto López, Manabí, Ecuador (1°33'S, 80°49'W), 50-120 m, longline, 19 Jul. 1994.

### Diagnosis

A species of *Myroconger* with body rather robust; snout relatively short; teeth on intermaxillary, maxilla and dentary prominent and sharp, many with dark brown to black

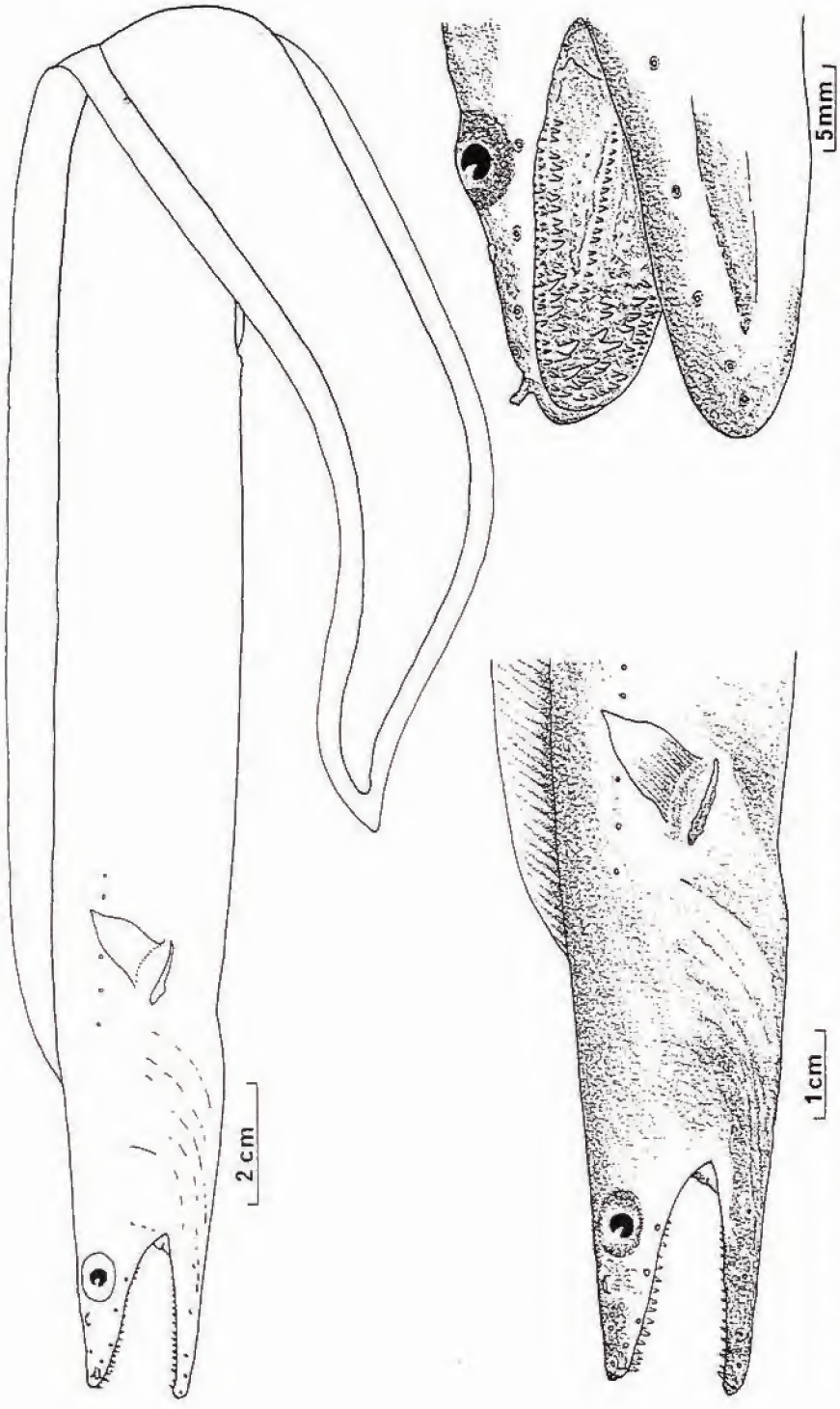


Fig. 3. - *Myroconger nigrodentatus*, holotype MNHN 1994-845, SL 360 mm. A: body, lateral view; B: head; C: anterior part of head, ventrolateral, to show intermaxillary, maxillary and vomerine teeth.



internal pigment, a single row of small teeth on vomer, a moderately large, almost horizontal slit-like branchial aperture; preanal vertebrae 43, precaudal vertebrae 50, total vertebrae 123.

### Description

Body moderately elongate, and compressed along its length (Fig. 3A). Snout moderately sharp, depressed. Lower jaw slender, its tip slightly in advance of snout tip. Anterior nostril a short, narrow tube near snout tip; posterior nostril a somewhat folded aperture with a slightly raised rim placed about level with upper margin of eye, closer to eye than snout tip. Mouth cleft relatively long, extending behind eye for a distance about equal to two-thirds eye diameter. No lips. Eye relatively large, oval. Interorbital broad. Branchial aperture relatively long, slit-like, almost horizontal, placed wholly below pectoral fin base. Pectoral fin broad, relatively short, about equal to snout length, its base oblique, the fin directed somewhat dorsad. Dorsal fin origin noticeably before levels of branchial aperture and pectoral base. Anus placed a little before mid-length so that tail is somewhat longer than head and trunk (preanal) combined. Dorsal fin height about one-quarter of body depth, anal fin lower. Caudal fin pointed. Lateral line pores almost undetectable, 6 present, the first two just in front of level of pectoral base, the remainder following behind. Head pores rather few (Fig. 3B). Supraorbital pores 3, with one ethmoid and two others above and behind base of anterior nostril; infraorbital pores four, the last below middle of eye; no postorbital pores; preoperculo-mandibular pores 5, all in front of rictus; no other pores.

Teeth on jaws, intermaxillary and vomer (Figs 3C, 4) conspicuous, sharp, slightly recurved, multiserial on jaws and intermaxillary, uniserial on vomer. Many teeth of jaws and intermaxillary with internal dark brown to black pigment about halfway along length of each tooth (Fig. 5). Three rows of teeth on maxilla and dentary; about 50 in outermost row and smallest, about 15 in innermost row and largest. About 20 intermaxillary teeth, slightly larger than those in rest of mouth. Eighteen vomerine teeth, uniserial, the row reaching to just beyond level of posterior margin of eye.

Colour after being brought ashore to the fish market bright orange over most of body including fins, though somewhat less obvious below mid-lateral level; a prominent,



Fig. 4. - *Myroconger nigrodentatus*, holotype MNHN 1994-845, SL 360 mm. Upper (left) and lower (right) dentition.

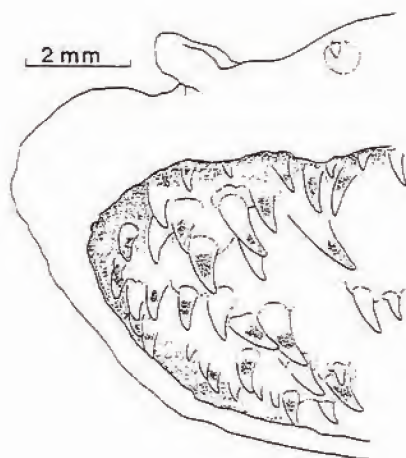


Fig. 5. - *Myroconger nigrodentatus*, holotype MNHN 1994-845, SL 360 mm. Detail of anterior intermaxillary and maxillary teeth to show pigmentation along length of each tooth; ventrolateral view.

broad, diffuse yellow stripe along body above mid-lateral level. These colours are rather faint in the alcohol-preserved specimen; snout and lower jaw darker; a broad area around anus lacking pigment; narrow lighter areas around head pores.

Holotype a maturing female packed with ova. A longitudinal slit along belly to determine sex and reproductive state of specimen.

#### Distribution and biology

The holotype was retrieved from a fish market at Puerto López, Manabí, Ecuador not long after it had been brought in by fishers. The men had been fishing for cusk eels (Ophidiidae), their main catch typically being the ophidiids *Brotula clarkae*, *B. ordwayi* and *Lepophidium negropinna*. They would normally fish over a muddy bottom in 50-120 m though their catch on this occasion could well have been on hard bottom in 70-80 m. Since the eel was previously unknown to these regular fishers we suggest that it was caught on an isolated patch of hard bottom.

#### Etymology

The specific name is meant to denote "dark toothed" and is derived from the Latin *niger* meaning dark or black and *dentatus* meaning toothed in reference to the internal dark pigment of many of the jaw and intermaxillary teeth.

#### Affinities of the two species

The holotypes of the two other known species have been studied, i.e., *Myroconger compressus* Günther, 1870 and *M. gracilis* Castle, 1991. The four species are compared in table I. In body shape the species form more or less of a series with *M. compressus* and *M. nigrodentatus* the least slender and elongate and most compressed in section and *M. proluxus* the most slender and elongate though rounded in section. The snout of *M. proluxus* is noticeably longer and more depressed than that of the other three species. Teeth of *M. proluxus* are rather similar to those of *M. nigrodentatus* and *M. gracilis* but are conspicuously more prominent than those of *M. compressus*, especially on the jaws. Internally,



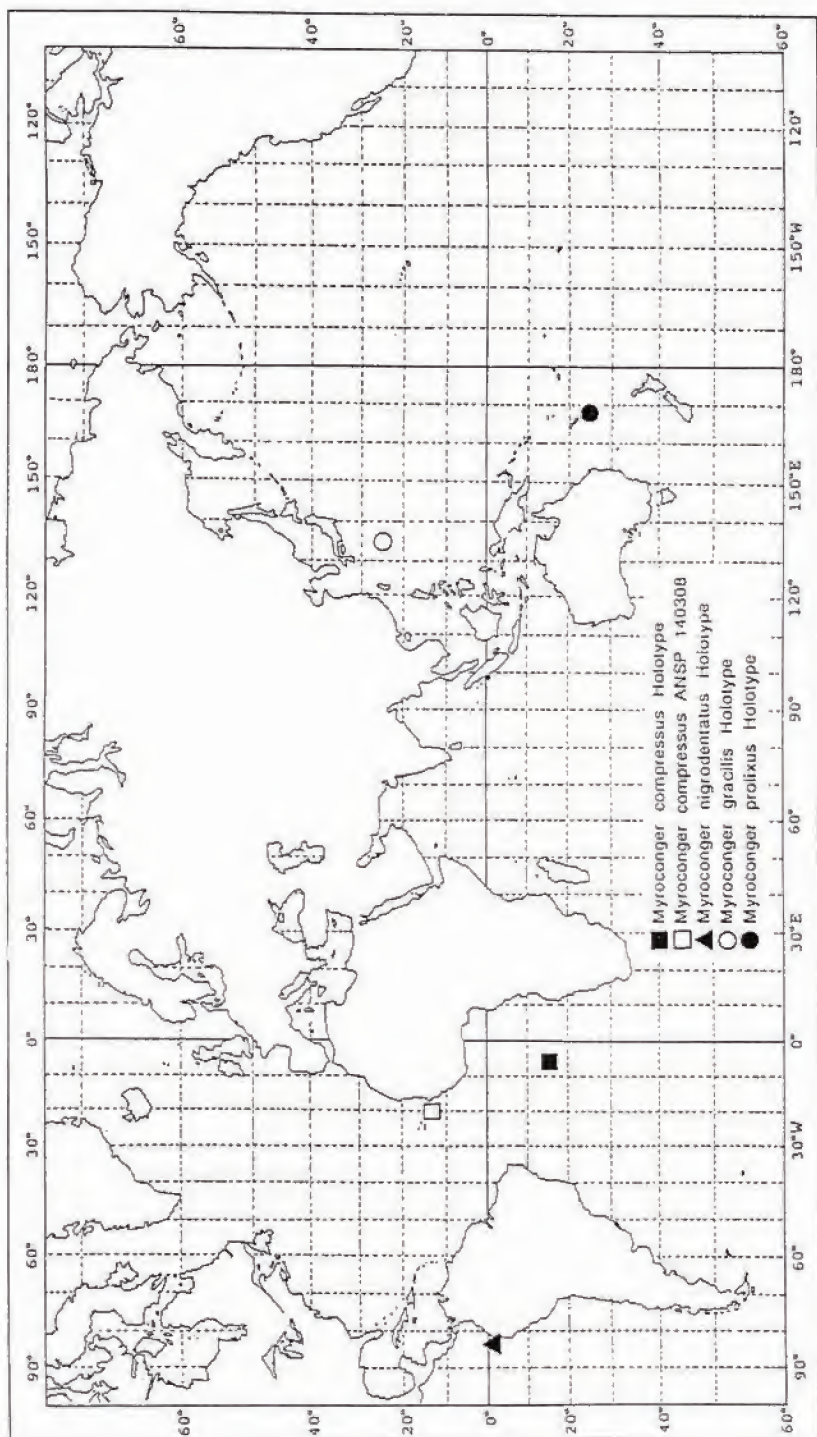


Fig. 6. - Records of *Myroconger* specimens.



Fig. 7. - *Myroconger prolixus*, holotype MNHN 1994-844, fresh specimen (photo C. Roberts).

Fig. 8. - *Myroconger prolixus*, holotype MNHN 1994-844, thawed specimen (photo C. Roberts).

Fig. 9. - *Myroconger nigrodentatus*, holotype MNHN 1994-845, fresh specimen (photo P. Bearez).



Table I. - Meristic and morphometric characters of the holotypes of the four species of *Myroconger*.  
 \*ANSP 140308, Dakar, Senegal (Smith, 1984).

	<i>M. nigrodentatus</i> MNHN 1994-845	<i>M. compressus</i> BMNH 1867.10.8.49 (Smith, 1984)	<i>M. gracilis</i> HUMZ 80284	<i>M. prolixus</i> MNHN 1994-844
Total length (mm)	366	538	484	383
<b>Meristic characters:</b>				
Pectoral rays	16, 17	16*	16	15, 16
Dorsal rays before level of anus	100	?	134	156
Total dorsal rays	298	?	349	398
Total anal rays	213	?	229	239
Predorsal vertebrae	6	?	7	5
Preanal vertebrae	43	47	53	57
Precaudal vertebrae	50	52	65	71
Total vertebrae	123	131	139	147
<b>Morphometric characters (% TL):</b>				
Standard length	98.4	98	98.5	98.4
Preanal length	45.6	45	44.5	45.4
Predorsal length	13.6	12	9.9	10.3
Head length	17.4	14	10.9	11.8
Depth at anus	7.5	-	5.1	4.6
<b>Morphometric characters (% head):</b>				
Snout length	21.0	24	23.0	27.1
Eye (horizontal diameter)	15.1	12 - 14	15.0	13.9
Interorbital distance	18.9	-	18.2	20.9
Mouth length (snout to rictus)	41.9	48	45.4	49.5
Branchial aperture length	18.1	10 - 12	11.2	8.4
Pectoral length	22.1	19 - 22	20.1	17.8

but reflected in the more elongate body form, *M. prolixus* has more preanal, precaudal and total vertebrae and more dorsal and anal fin-rays than have either *M. gracilis*, *M. compressus*, or *M. nigrodentatus* which has the lowest meristic counts. The large, slit-like almost horizontal branchial aperture of *M. nigrodentatus* is a distinctive feature of this species alone.

Without further specimens and information, e.g., from osteology, for the *Myroconger* species it is not possible to be confident about evaluating the affinities of the species. However, at least on the external characters of body depth, head length, predorsal length and meristics which in essence are reflections of overall body attenuation, the two Indo-west Pacific species (*M. gracilis* and *M. prolixus*) appear to be more alike than either is to *M. compressus* or *M. nigrodentatus*.

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## REFERENCES

- CASTLE P.H.J., 1991. - First Indo-Pacific record of the eel family Myrocongridae, with the description of a new species of *Myroconger*. *Copeia*, 1991(1): 148-150.
- LEHODEY P., RICHER de FORGES B., NAUGES C., GRANDPERRIN R. & J. RIVATON, 1992. - Campagne BERYX XI de pêche au chalut sur six monts sous-marins du Sud-Est de la Zone Economique de Nouvelle-Calédonie (N.O. "Alis", 13 au 23 octobre 1992). *Rapp. Missions Sci. Mer: Biol. mar.*, 22: 1-93.
- LEVITON A.E., GIBBS R.H. Jr., HEAL E. & C.E. DAWSON, 1985. - Standards in herpetology and ichthyology. Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia*, 1985(3): 802-832.
- ROBINS C.R., 1989. - The phylogenetic relationships of the anguilliform fishes, pp. 9-23. *In: Fishes of the western North Atlantic*. Vol. I. Orders Anguilliformes and Saccopharyngiformes (Böhlke E.B., ed.). *Mem. Sears. Found. Mar. Res.*, 1(9).
- SMITH D.G., 1984. - A redescription of the rare eel *Myroconger compressus* (Pisces: Myrocongridae), with notes on its osteology, relationships and distribution. *Copeia*, 1984(3): 585-594.
- SMITH D.G., 1989. - Family Myrocongridae, pp. 98-103. *In: Fishes of the western North Atlantic*. Vol. I. Orders Anguilliformes and Saccopharyngiformes (Böhlke E.B., ed.). *Mem. Sears. Found. Mar. Res.*, 1(9).

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